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WORLD MARITIME UNIVERSITY

Malmö, Sweden

**ASSESSING STAKEHOLDER EXPECTATIONS
FOR MARINE SPATIAL PLANNING IN TONGA**

Implications for governance

By

HULITA LAMASIALEVA FA'ANUNU

Tonga

A dissertation submitted to the World Maritime University in partial
fulfilment of the requirement for the award of the degree of

MASTER OF SCIENCE

In

MARITIME AFFAIRS

(OCEAN SUSTAINABILITY, GOVERNANCE MANAGEMENT)

2019

DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

(Signature): 

(Date): 24th /09/2019

Supervised by: **Dr. Mary S. Wisz (Associate Professor)**

Supervisor's affiliation: **Ocean Sustainability, Governance and Management (World Maritime University)**

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ABSTRACT

The ocean and coasts within the EEZ of Tonga are experiencing increasing intensification of sea use and development, which in turn is placing a pressure on the marine ecosystem. These pressures lead government and stakeholders into taking actions to protect and further develop MSP. Marine Spatial Planning (MSP) has been adopted by the government of Tonga in order to allocate the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives. MSP often struggles because stakeholders' come to MSP with different and often conflicting expectations and priorities. This study conducted 12 in-depth based on face to face interviews with key MSP stakeholders involved in MSP in Tonga. The stakeholders included representatives from seven ministries and government departments such as the Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change & Communications (MEIDECC), the Ministry of Lands and Natural Resources (MLNR), the Ministry of Agriculture, Food, Forests and Fisheries (MAFFF), the Ministry of Finance and National Planning, the Ministry of Internal Affairs, the Ministry for Commerce, Consumer, Trade, Innovation, and Labor and the Ministry of Infrastructure and Tourism. Each interviewee was asked to identify what it considered to be its main expectations and priorities for the Tonga MSP process, and identify where these expectations might conflict with the priorities of other MSP stakeholders. Analyses of the interviews showed that there are a conflicts in use between the shipping route and tourism activities such as whale watching. Further, there are also opportunities for compatible use include community special management area and tourism activities. Based on the results of the stakeholder expectations analysis, this thesis recommends that a zoning system be considered to address the needs for complex multiple use and to enforce the regulation in protecting the marine resources. This study highlights the utility of identifying stakeholder priorities and expectations of MSP in order to identify potential conflicts in use and implementation of the plan, and to identify opportunities

for planning the emerging activities for compatible uses. Future extensions and applications of this research could use these results to promote focussed discussion of the plan across stakeholders, and potential ideas for fair zoning system and coordination and collaboration across ministries in the Tongan Government in developing the MSP.

KEYWORDS: Marine Spatial Planning, Stakeholder engagement, Governance, Zoning, Multiple conflict, Priorities

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LIST OF ABBREVIATIONS

MSP- Marine Spatial Planning

NGO's- Non-Governmental Organization

EBM- Ecosystem-based management

SIDS-Small Island Developing States

SMA- Special Management Area

SDG- Sustainable Development Goals

MLNR- Ministry of Lands and Natural Resources

MEIDECC- Ministry of Meteorology, Energy, Information, Disaster Management,
Environment, Climate Change & Communications

MAFF- Ministry of Agriculture, Food, Forests and Fisheries

EEZ- Exclusive Economic Zone

PUMA- Planning Urban Management Agency

UNESCO- United Nation Educational, Scientific and Cultural Organization

MPA-Marine Protected Area

DO-District Officer

MACBIO-Marine and Coastal Biodiversity Management in Pacific Island Countries

PIC- Pacific Island Countries

REC- Research Ethics Committee

UNCLOS- United Nation Convention Law of the Sea

CBD- Convention on Biological Diversity

EIA- Environment Impact Assessment

SAMOA- SIDS Accelerated Modalities of Action

1 INTRODUCTION

Marine ecosystems have been a significant source of sustenance throughout human history for people who live along the coast, as well as in land-locked communities (Kittinger et al., 2014). These systems generate many ecosystem services, raw materials for the production of many goods and services, and are also utilized for recreation (Ehlers, 2016).

However, anthropogenic activities, including fishing, tourism activities, shipping and trade, coastal developments coral extraction, mining, boat anchoring and energy exploration have impacted marine ecosystems (Curtin and Prellezo, 2010). Illegal, unreported, unregulated fishing, pollution, destruction habitats and eutrophication, as well as climate change compound these impacts (Bolam et al., 2006; Dawson et al., 2010). Although these activities can cause conflict due to overlaps of multiple activity in the ocean (Bauhus et al., 2010).

Marine Spatial Planning (MSP) has been proposed as a strategy to address challenges arising from multiple use of the ocean and coasts. MSP is defined by the United Nation's Educational, Scientific, and Cultural Organization (UNESCO) as, "a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic and social objectives that are always specified in political process (Ehler & Douvere, 2010)." MSP has been implemented globally to manage activities at sea, reduce conflicts among users, and preserve critical ecosystem services. (Douvere & Ehler, 2009). MSP is commonly used as a central component of economic development and environmental planning to address the complexities of ocean ecosystems (Ehler, 2008; Tuda, 2014).

Ecosystem-based management (EBM) has also been widely advanced as a more effective approach for managing complex and highly interconnected marine ecosystems (Böhnke-Henrichs et al., 2013; Cicin-Sain et al., 1998). A related approach for achieving more integrated marine management and as a tool for implanting EBM is Marine Spatial Planning (Douvere, 2007). However, MSP is not always used as an EBM tool (Christie et al., 2005).

Today, the human capability to exploit the marine environment has intensified through advanced technologies—resources can be extracted from the oceans at depths and at distances from shore not possible previously (Wackernagel & Rees, 1998). For example, the increasing demand for good quality sea-bed minerals has caused fisheries to collapse and threats to marine biodiversity, triggering the need for greater integration in marine resource management and policy, globally ((Messieh et al., 1991; Portman, 2011). Nevertheless, MSP acts as a management tool for marine environments in some places that moves beyond the traditional sectoral governance of marine spaces (Smith & Brennan, 2012). MSP also aims to “reduce conflicts between sectors and create synergies between different activities in the ocean” (Ehler & Douvere, 2009).

1.1 PROBLEMS OF MSP - DIFFERENT EXPECTATIONS OF PRIORITIES

Marine Spatial Planning, engages all marine stakeholders often with different interests, including industry, government authorities, NGO's and ocean users. These stakeholders brought together to collaborate on how to manage the use of ocean resources through MSP (Gopnik et al., 2012). A challenge of MSP can include different expectations of the value of MSP which may vary in different places (Carneiro, 2013). In order to generate a conceptual framework for MSP, it is important to identify what the priorities are and what should be evaluated in the plans to achieve stakeholder expectations and define success in multiple dimensions of MSP (Carneiro, 2013).

The identification of each stakeholder's expectations and priorities is important to limit the conflicts between the ocean users. Each stakeholder has their own targets and main key priorities in relation to their own mandates or objectives such as sustainable growth of blue of maritime economies, ecosystem-based management, shipping routes, laying cables and deep-sea mining. (Collie et al., 2013). In the planning process, a planning guidance is important to follow including objective setting through prioritisation on what the expectations from MSP. Spatial data such as geographic and information data which identified location and features in the ocean are also need to support planning. (See Figure 1). This will make it easier for decision makers and practitioners to address the objectives and tangible issues on the MSP process (Gilliland & Laffoley, 2008).

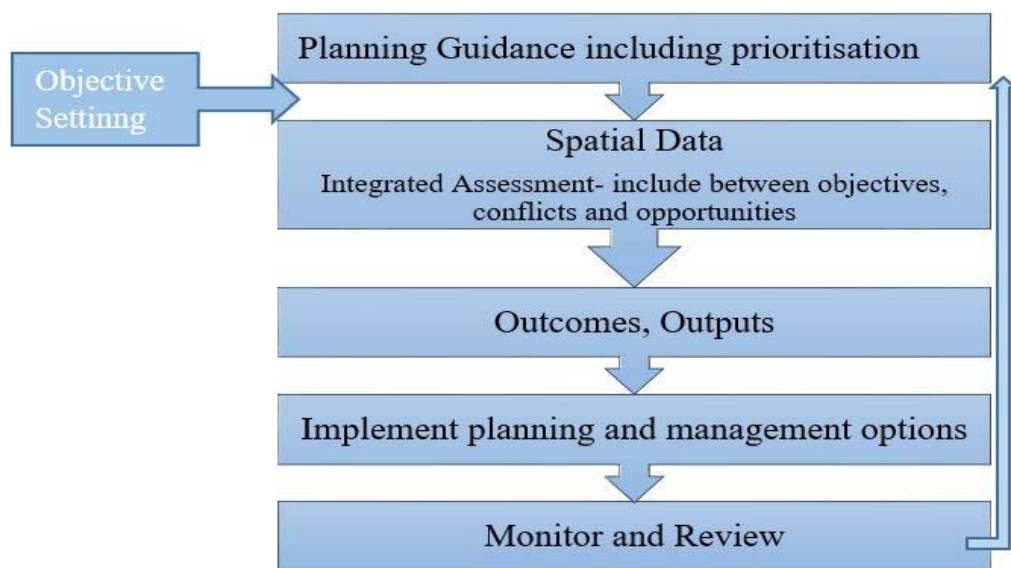


Figure 1: Marine Spatial Planning Process

Therefore, in the process of the Marine Spatial Plan, it is important all stakeholders to identify their objectives at the start in order to come up with a good plan (see Figure 2). In addition, when all the stakeholders have been identified that it is important to discover their interests and concerns on their position toward the resources (Pomeroy & Douvere, 2008).

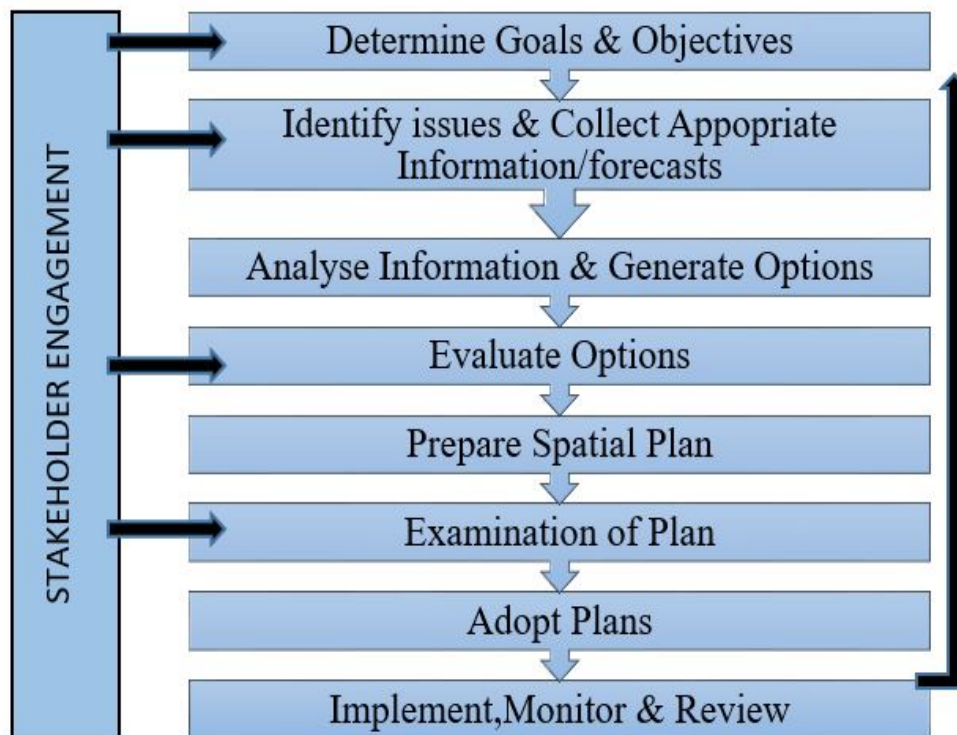


Figure 2: Stakeholder engagement in Marine Spatial Planning Process

1.2 WHEN EXPECTATIONS AND PRIORITIES ALIGN

There are cases where stakeholders' expectations and priorities match in working toward a common goal to achieve sustainable development in ocean resources and economic growth (Ban & Klein, 2009). The expectations and priorities of Marine Spatial Plan will match according to the decision maker and the local resident's perceptions and interest in the ocean space (Leslie, 2005). Though an active and effective participation of policy-makers, scientists, citizens and other stakeholders will promote cross sectoral and cross border dialogue and cooperation between stakeholders through a participatory process (Bäckstrand, 2003). MSP communication involves relevant national/ local authorities and other regions with more experience in the MSP process, such as the EU, to identify, assess and recommend innovative governance approaches and policy tools aiming at improving the management of human activities at sea (Katsanevakis et al., 2011)

The balance of demands for development with the need to protect marine ecosystems across the stakeholders and the people will lead to participation to achieve social and economic objectives in an open and planned way (Ban et al., 2013).

1.3 WHY PRIORITIES/ EXPECTATIONS DIFFER

Stakeholders can have different expectations according to what their ministry objectives are and their priorities (Milligan et al., 2009). In the first start of the Marine Spatial Plan process, it is important for the stakeholders to identify the priorities of the relevant stakeholders and what they expect from it (Tompkins et al., 2008) This will allow the decision makers to identify the area of differences and where the conflicts and compatibilities are. (Freeman et al., 2016).

A case in point is at the marine protected areas where conflicts between conservationists and fishermen are expected (Klein et al., 2008). In this case, designation of MPA can increase conflict between fishers over limited or declining resources. Another example in which different expectations for MSP is that for some of the stakeholders their priority is nature conservation while tourism promotes sports fishing and scuba diving to attract a number of tourists, which might cause conflict in between with fisheries regarding the impact of this activity on the marine habitat such as coral reefs (Halpern et al., 2008).

1.4 CHALLENGES WHEN PRIORITIES /EXPECTATION DIFFER

There are challenges for stakeholders when priorities and expectations differ, so it is difficult to create, establish and organize the use of marine space as well as the interaction between its uses (Agardy et al., 2011). However, there are some difficulties in setting up the priorities due to the overlapping of interest from different stakeholders, but setting up priorities will allow each stakeholder to settle the issue where a conflict might arise and identify the area of compatibility (Kyriazi, 2018). Another example where the expectations of stakeholders might conflict are, for

example, the restricted areas for use and no use (Moore et al., 2017). The purpose of no take zone or restricted areas is to ensure that the resources can be replenished and habitat can be protected. Some of the habitats are the hydrothermal vents, seamounts, seagrass, coral reefs which are critical to the lives of many pelagic migratory species such as Tuna and snapper fish. These species can be putting a no take zone area to ensure that the habitat and spawning ground are continuing to be sustainable and protected from some other activities such as shipping, anchoring etc. This could make it difficult to prioritise human activities.

However, in the concept of mutual learning where approach of a situation as it is relating to people (Newig et al., 2017). This is the idea that through good process, and work on a set of common principles and goals, stakeholders with diverse interests and priorities can learn to respect each other's perspectives and find common ground (Weisbord et al., 2000) (Weisbord, 1992). For example, there may be areas of conflict between aquaculture and fisheries, but both should have an interest in the health of the ecosystem they both depend on. Principles such as ecosystem health and fair allocation of access to resources can help resolve areas of specific conflict, especially whether those affected get to negotiate the solution (Lockwood et al., 2010).

1.5 MARINE SPATIAL PLANNING CONCERNS

1.5.1 Inclusion of Stakeholders

Not everyone has embraced MSP as a desirable next step in ocean management (Flannery et al., 2016). Some ocean industry sectors, particularly offshore deep sea fishing and international shipping worry that MSP could create uncertainty and harm economic activity and that the policy is being developed without adequate congressional engagement and consideration of the views of ocean users, local community, commercial fisheries and recreational interests (Gopnik, 2008).

If regions are to adopt MSP, they will have to balance their proposed benefits with the concerns expressed by the stakeholders, navigating a path forward that meets their needs (Qiu & Jones, 2013).

2 MSP IN TONGA

The increase of sea use has led to ineffective management practices, unsustainable use of marine resources causing conflicts of using the sea and environmental destruction. As a consequence, Tonga government adopted the marine spatial planning system, as a holistic approach for integrated oceans management.

The Kingdom of Tonga is an archipelago of 174 islands scattered across 360,000sq.km of the Pacific Ocean (Samani et al., 2006). Tonga islands have a vast open ocean with only a small portion of the Tongan territory, about 720sq.km, which is above sea level. Tonga, as a Small Island Developing State with a large marine environment, recognizes the ongoing and future significance of the ocean in support of the livelihoods of its people. The ocean and coasts around Tonga offer many ecosystem goods and services including food security, transportation, recreational activities and financial benefits. There are also many threats affecting Tonga marine environments including overfishing, use of illegal fishing techniques, pollution, anchoring, climate change and tourism activities. Tonga is another example where the expectations of stakeholders might overlap or conflict, and could make it difficult to prioritise human activities. Therefore, there is a need for further improvement in coordinating activities in order to avoid user/use conflicts while ensuring an optimal allocation of space and uses to conserve marine resources.

Marine Spatial Planning process began in Tonga in June, 2015. MSP was developed as a way forward in accordance with Tonga Marine and Coastal Biodiversity Management in Pacific Island Countries (MACBIO) Project (Gassner, 2013). The MSP project is now at the planning phase in consultation with the relevant stakeholders. This cross-government planning has been established to comprise seven ministries, known as the “Ocean Seven”. The Ocean 7 was established (Tonga’s

marine spatial planning technical working group) and co-chaired by three ministries. The development of MSP has a vision of “Ecologically sustainable social and economic development of Tonga’s ocean for the benefit of all Tongans” (Marine and Coastal Biodiversity and Management in Pacific Island Countries, 2018).

There is a diversity of the stakeholders’ involvement in marine spatial planning in Tonga such as government ministries, non-government organization, business sector and the public. There is a strong community involvement in marine spatial planning because they are the main source of ocean users. It is important to recognize the local perspectives and public participation throughout the marine spatial planning process for decision making and proper planning (Liu et al., 2011).

The MSP processes in Tonga involve determining its terms of reference, vision and objectives. Tonga’s marine spatial planning technical working group helps in collation of datasets including environmental, biological, uses and risk variables to assess and prepare for use in marine spatial planning. The technical committee also assesses the legal basis for the marine spatial plan, an ecosystem service evaluation and report on the special and unique marine areas. This will help in placement of guidelines for the ocean management areas and draft national consultation strategy to the public.

The objective of this paper are

- To examine the expectations of the main priorities for MSP priorities through close examination of Tonga as a special case
- Identify potential conflicts that may arise while designating and/or managing the MSP due to different priorities from different ministries
- To investigate what implementation recommendations can be drawn from this research

3 METHODOLOGY

This research focuses on the analysis of the interview based on what the stakeholder expectation and priorities of the Marine Spatial Planning are. This research will identify the potential conflicts due do different priorities on MSP planning and finally discuss what the step forward for the implementation of MSP in Tonga is.

3.1 STUDY AREA

The study area focused ion Tongatapu (see Figure 3), the largest island in the Kingdom of Tonga. This area was chosen because the majority of the government authorities and stakeholders involved in the Marine Spatial Planning are located in Nuku'alofa, the capital of Tongatapu. Tongatapu has a population of 100,651 (Tonga Statistics Department, 2017).

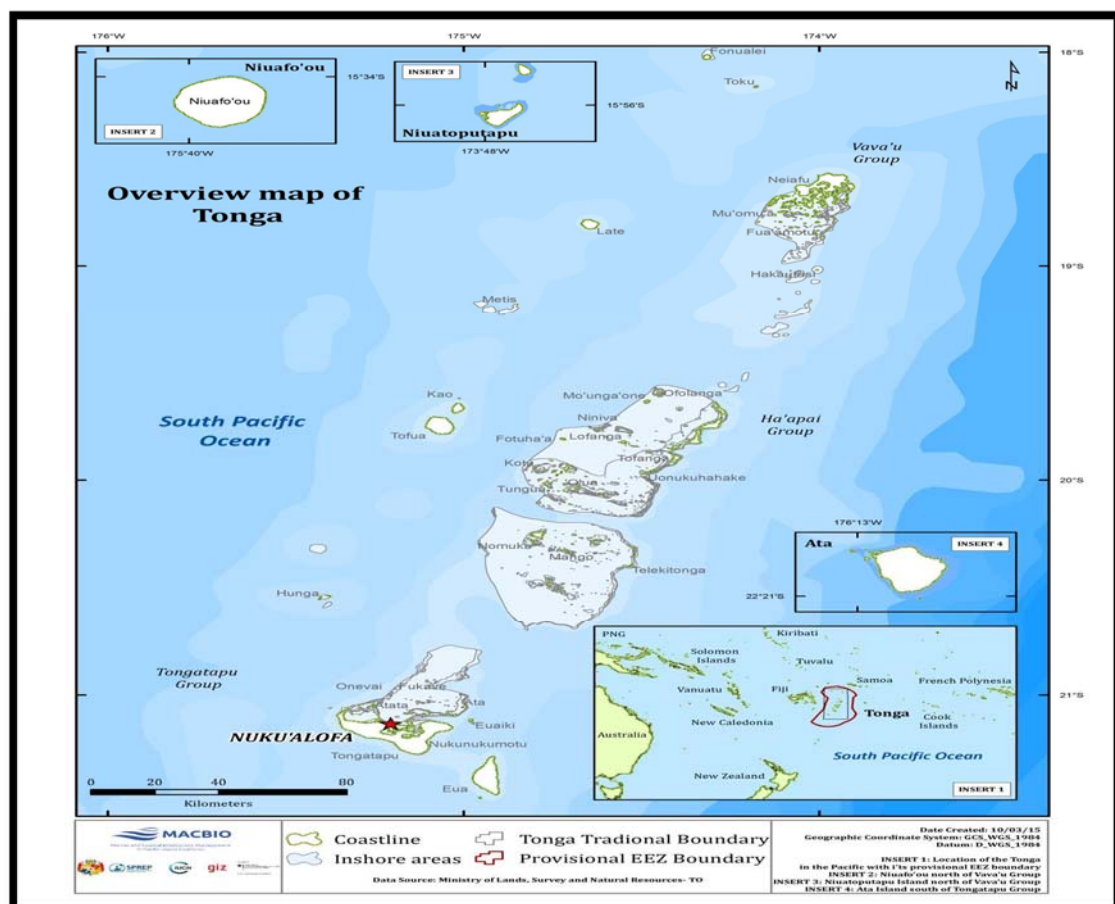


Figure 3: Map of Tonga (Study Area)

3.2 STUDY DESIGN

For this study semi structured interviews were used to identify the expectation of all ministries involved in the marine spatial plan. Qualitative social data which maintains the narrative informants and complement general patterns with specific and, perhaps non-statically significant, results are essential to complete understanding of complex phenomena (Wright, 2016; Christie, 2011). The collection of primary data took place over a 14-week period in April- July 2019 consisting of interviews of stakeholders, followed by a review of existing literature.

3.3 PARTICIPANTS

For this study interviewees were selected. The ministry chief executive officers for the ministries involved in MSP were targeted. This includes the government ministries, non-governmental organisations and relevant stakeholders as summarized in Table 1.

Table 1: Research Participant List

Name	Age	Type of Interview	Organisation
Karen Stone	43	Semi-structured Interview	VEPA (NGO's)
Keasi Pongi	45	Semi-structured Interview	Civil Society (NGO's)
Lilieta Takau	48	Semi-structured Interview	MSP Coordinator
Mafoa Penisoni	36	Semi-structured Interview	Natural Resources Department (Geology)

Malakai Lomu Sika	58	Semi-structured Interview	Tonga Waste Authority
Meliame Tu'alau	37	Semi-structured Interview	Marine & Ports Authority
Samuela Pohiva	28	Semi-structured Interview	Ministry of Internal Affairs
Siola'a Malimali	53	Semi-structured Interview	Ministry of Agriculture, Food, Forests and Fisheries
Sione Manumanu	60	Semi-structured Interview	District OFFICER (Western)
Sitiveni Fe'ao	64	Semi-structured Interview	District OFFICER (Eastern)
		Semi-structured Interview	Tourism
Tukua'italatau Tonga	57	Semi-structured Interview	National Planning Management Agency (PUMA)

3.4 INTERVIEW STRUCTURE

Participants were recruited through email by giving them a short introduction of the research topic and an overview of what the purpose of investigation in this study was.

The interview was performed face to face by one of the officers in Tonga due to practical reasons. There were 11 main questions (Appendix A). The questions asked focused on priorities and expectation on Tonga MSP. The interviewee was invited to speak freely about the core subject and to add additional information that did not fit into the identified subject areas. The interview was generally 30 minutes to 1 hour in

length. The interview was conducted in both languages, Tongans (mother tongue) and English for non-Tongan speakers. This made it easier for the interviewees to express their opinion

3.5 ETHICS CLEARANCE

Interview questions, information sheet (Appendix B) and consent form guiding this research were approved by the Research and Ethics Committee (REC) (Appendix C) of World Maritime University in Malmö in April 2019. In addition, a research permit was submitted to the Prime Minister Office in Tonga for their approval before continuing on to collect data in Tonga (Appendix D). Before conducting the interview in Tonga as part of the research guidelines, the confidentiality agreement/consent document was signed by the respondents prior to the beginning of the interview. As approved, all materials will be retained for the research period, and then will be permanently deleted. The identification of the participants is not revealed throughout the studies for confidentiality and data integrity reasons. Therefore, each respondent is recognized by counting systems R1, R2, R3, R4, ... etc.

3.6 DATA RECORDING AND ANALYSIS

A written note was taken during the interview recording on the key points made by the interviewee. Interviewees were given the opportunity to review the written record in order to ensure that it accurately represented their comments. This helped to alleviate concerns regarding legibility, imperfect memory, and the unintentional mixing of data (Thompson et al., 2017).

The interview was organised and analysed in three stages following the recommendations in Hoffart (2000) and the approach taken by Leete et al. (2013).

Stage 1: As the interview transcripts were analysed, themes and sub-themes were modified, refined and combined to improve clarity (Sutton & Rudd, 2016). Qualitative data was broken down into discrete units of conceptual information (Saunders, Lewis,

& Thornhill, 2007). Structural coding was used to label each unit based on the guiding themes of the interviews.

Stage 2: The data labels were organised into categories according to which themes they fell under. Additional categories were also added to represent emergent themes reflecting representation of unanticipated interview responses (Bradley et al., 2007).

Stage 3: The utilised data were examined to identify the common themes and similarities across the interviewees and then the analysis was presented.

3.7 INTERVIEW RESPONDENT SUMMARY

Twelve interviewees participated in the interviews with ministries, non-governmental organizations and community district officials, who also have diverse areas of expertise and knowledge in the field of Marine Space Planning. The time of the interview was between 30 and 60 minutes. Their responses were noted for transcription and coding for further textual analysis and at the same time each interview was also audio-recorded. However, there are also ranking questions that were required to be sent before-hand for the respondent's information before starting the interview. While analysing the results, the responses were summarized and grouped into specific themes. References to the respondents in the discussion were made as R1, R2, R3, etc.

Based on the inferred compatibility and conflicts derived from the interviews, a matrix was composed to summarize maritime uses. This matrix activity identified that there are likely compatibility and conflicts among the sectors. There were 15 major users across the coastal and offshore areas and x represents to what extent the activity does actively have conflict on the other users. For example, from the matrix it was identified that the major conflicts are deep sea mining, which almost always conflicts with all the other users. Furthermore, the other area with no x represents there would be a sector in which their activities would be compatible with each other.

4 RESULT

4.1 INDIVIDUAL EXPECTATIONS OF MARINE SPATIAL PLANNING

Table 2 highlights the idea of an individual's perceptions of what to achieve from Marine Spatial Planning. Four common themes were identified from the respondents, namely sustainably manage the ocean resources with improvement of economic development, food security, and resilience to climate change, planning the activities in the ocean, preventing conflicts between ocean users and encouraging intergovernmental and stakeholder collaboration and coordination.

Table 2| Individual perceptions and expectation of what to achieve from MSP

Perception and expectation of MSP	Number of interviewees with their expectation to achieve from MSP
1. Sustainably manage our ocean resources with the improvement of economic development, food security and resilience to climate change	11
2. Planning/Organize the activities in the ocean	4
3.Prevent conflicts between the ocean user	4
4. Encourage intergovernmental and stakeholder collaboration and coordination	8

Table 3 shows each individual is experienced in Marine Spatial Planning. According to the respondents they had no background specifically in MSP, but they had experience in MSP through the community Special Management Area program and through spatial management planning including habitat spatial planning, while some of the respondents had no experience in MSP.

Table 3| Individual background and experience in marine spatial planning

Experience to do Spatial planning	Number of interviewees with background and experience on MSP
1. Community Special Management Area Program (SMA's)	10
2. Spatial management planning &Habitat spatial planning	1
3. No experience	1

According to the stakeholders' potential influence on MSP, it shows from the respondent's rate that all of the respondents had very high influence on MSP and most of the stakeholders took part in MSP in an advisory role. It also shows respondents think of how the Marine Spatial Planning should be ruled in Tonga. There are two selected themes highlighted, which use the strictly top down approach and participatory approach. Some of the respondents said that MSP at first was strictly top down approach and now they are focused on the participatory approached when communities are involved.

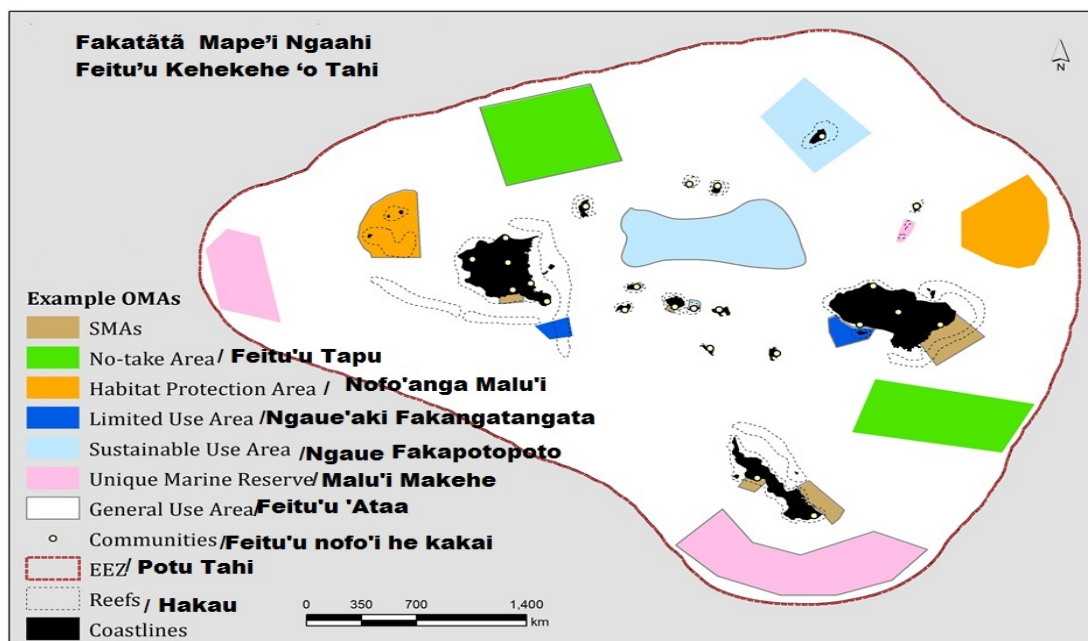
4.2 ZONING APPROACHES

Table 4 shows the idea highlighting on the approaches for a zoning system. In developing MSP there are areas are to be zoned for restricted use or no use and many more purposes. The respondents identified an important key area for zoning if there could be a zone for restricted use or no use such as habitat protection, species protection and resource protection. In addition, there are particular species mentioned that needed to have some restrictions and no use such as hydrothermal vents, coral, sea cucumber, whale and ecological and biological significance of the ecosystem.

Table 4| Zoning approaches of areas to be zoned for restricted use/ no use and its purposes

Zone for particular function	Number of interviews who prioritize the particular zoning approach
1. Species protection	9
2. Habitat protection	9
3. Resource protection	4
4. Ecological function	3

Figure 4: Example of zoning system



Source: (Ministry of Lands and Survey, 2018)

Figure 4 shows the example of the zoning system in Tonga given from the respondents.

There are also key areas identified from the findings that the respondents also wanted to see for a specific zone or designate areas for particular human activities as

highlighted in Table 5, such as fishing, whale watching, shipping route, general use, zone for mooring and anchoring as well as waste disposal.

Table 5| Human activities proposed by the respondents to put as designated areas or as specific zone for each activities

Human activities potentially designated for zoning proposed by interviewers	Number of interviews who prioritize the human activity designate for zoning
1. Fishing	11
2. Whale watching	7
3. Shipping Route	5
4. General use	2
5. Mooring & Anchoring	2
6. Waste disposal	6

4.3 PRIORITIES FOR PLANNING

In Table 6 the average rankings of what should be prioritized for planning are summarized according to each respondent's individual view. All responses were based on 5-point Likert scales. Responses for planning priorities ranged from 1 as "highest priority" to 5 as "low priority". There are five priorities for planning chosen, which include nature protection, shipping, recreation, fisheries, marine industries and urban development. The priorities with the largest average ranking is the most preferred choice for planning

Table 6| Individual organization Priorities for Marine Spatial Planning

Interviewees Organization	Nature Protection	Shippi ng	Recreat ion	Fisher ies	Marine Industries and Urban Development
Vava'u Environment Protection Association (NGO's)	1	5	4	2	3
Civil Society (NGO's)	2	5	4	1	3
MSP Coordinator	1	3	5	2	4
Geology	1	2	3	4	5
Waste Authority	1	4	5	3	2
Marine&Ports Authority	2	3	5	1	4
Ministry of Internal Affairs	1	4	5	2	3
Ministry of Fisheries	1	4	5	2	3
District Officers(West)	1	5	4	3	2
District Officers (East)	3	4	2	1	5
Tourism	1	5	3	2	4
Planning and Urban Management Agency	4	5	3	2	1

In addition to the organization priorities for MSP, the interviewees also ranked the subcategories from highest to lowest based on the priorities they ranked as highest priorities for MSP as can be seen in Table 6.

Table 7, nature protection has 6 subcategories listed such as coral reefs, seagrass beds, sandbanks, mangrove, nesting for turtles and salt marshes. These subcategories are ranking from highest to lowest priority. Highest priority = “1” and Low priority “6”.

Table 7| Individual interviewee ranked of Nature Protection subcategories to be considered for planning in accordance to highest priority to lowest priority in MSP

Nature Protection

Respondent #	Coral reefs	Seagrass beds	Sandbanks	Mangrove	Nesting for turtles	Salt marsh
1	1	2	5	3	4	6
2	2	3	4	1	5	6
3	3	2	4	1	5	6
4	4	5	2	1	3	6
5	1	2	4	3	5	6
6	1	3	5	2	4	6
7	1	3	4	2	6	5
8	1	3	4	2	5	6
9	2	3	4	1	5	6
10	1	2	4	3	6	5
11	1	3	4	2	6	5
12	-	-	-	-	-	-

Table 8 shows the interviewees ranking of fisheries subcategories. Fisheries have 4 subcategories listed such as commercial fisheries, artisanal fisheries, aquaculture (sea cucumber) and aquaculture for oyster. These subcategories are ranking from highest to lowest priority. Highest priority = “1” and Low priority “4”.

Table 8| Individual interviewee ranked of Fisheries subcategories to be considered for planning in accordance to highest priority to lowest priority in MSP

Fisheries				
Respondent #	Commercial Fisheries (trawl)	Artisanal Fisheries	Aquaculture (for sea cucumber exports)	Aquaculture (Oyster farms for pearls)
1	4	1	3	2
2	3	4	2	1

3	3	1	3	4
4	-	-	-	-
5	3	4	1	2
6	2	1	3	4
7	1	2	3	4
8	4	1	2	4
9	3	4	1	2
10	3	4	1	2
11	2	1	3	4
12	2	1	3	4

Table 9 illustrates the interviewees' ranking of subcategories priority. Marine industrial and Urban Development have 3 subcategories listed such as Deep sea mineral site, waste water drainage, ports infrastructure and port access. These subcategories are ranking from highest to lowest priority. Highest priority = "1" and Low priority "3".

Table 9| Individual interviewee ranked of Marine Industrial and Urban Development subcategories to be considered for planning in accordance to highest priority to lowest priority in MSP

Marine Industrial and Urban Development			
Respondent #	Deep sea mineral sites for extraction	Waste water drainage	Ports and port infrastructure including port access
1	3	1	2
2	3	1	2
3	-	-	-
4	-	-	-

5	3	1	2
6	-	-	-
7	3	1	2
8	3	2	1
9	3	2	1
10	-	-	-
11	-	-	-
12	3	2	1

Table 10 shows the interviewees' ranking of recreation subcategories. Recreation has 4 subcategories listed such as diving, whale watching, sport fishing and beaches. These subcategories are ranked from highest to lowest priority. Highest priority = "1" and Low priority "4".

Table 10| Individual interviewee ranking of Recreation subcategories to be considered for planning in accordance with highest priority to lowest priority in MSP

Recreation				
Respondent #	Diving	Whale watching	Sport fishing	Beaches
1	-	-	-	-
2	-	-	-	-
3	-	-	-	-
4	3	2	4	1
5	-	-	-	-
6	-	-	-	-
7	-	-	-	-
8	-	-	-	-
9	-	-	-	-

10	3	1	4	2
11	2	1	3	4
12	4	2	3	1

Table 11 shows the interviewees' ranking of shipping route subcategories. Shipping have 3 subcategories listed such as cruise shipping routes, local navigation, port access and national shipping routes. These subcategories are ranked from highest to lowest priority. Highest priority = "1" and Low priority "3".

Table 11| Individual interviewee ranking of shipping routes subcategories to be considered for planning in accordance with highest priority to lowest priority in MSP

Shipping Routes			
Respondent #	Cruise Shipping Routes	Local Navigation	Port Access and International Shipping Routes
1	-	-	-
2	-	-	-
3	3	2	1
4	2	3	1
5	-	-	-
6	2	3	1
7	-	-	-
8	-	-	-
9	-	-	-
10	-	-	-
11	-	-	-
12	-	-	-

4.4 POTENTIAL CONFLICTS BETWEEN SECTORS

Referring to Table 12, it demonstrates that there are spatial hotspots causing conflict between the various sectors engaged in marine spatial planning. These are the key themes which the respondents outlined based on their experience, such as conflict between tourism activity and special management area for fisheries, improper planning, shipping route, fishing ground area with deep sea mining proposed area, coastal infrastructure development, port authority operation, zoning system, lack of community awareness, lack of community and transparency among the ministries and political issues.

Table 12| Potential hotspots for conflict in each sector activities according to their priorities

Spatial hotspots for conflict in each sector activities	Number of interviewees who specify the spatial hotspot for conflict in MSP
1. Tourism activity and coastal community special management area	7
2. Improper planning of MSP	3
3. Shipping route with fishing ground	2
4. Fishing area with deep sea mining proposed area	10
5.Coastal infrastructure development with community	2
6. Port Authority operation with coastal community	1
7. Conflicts over the zoning system	12
8. Lack of community awareness	2

9.Lack of communication and transparency among the stakeholders

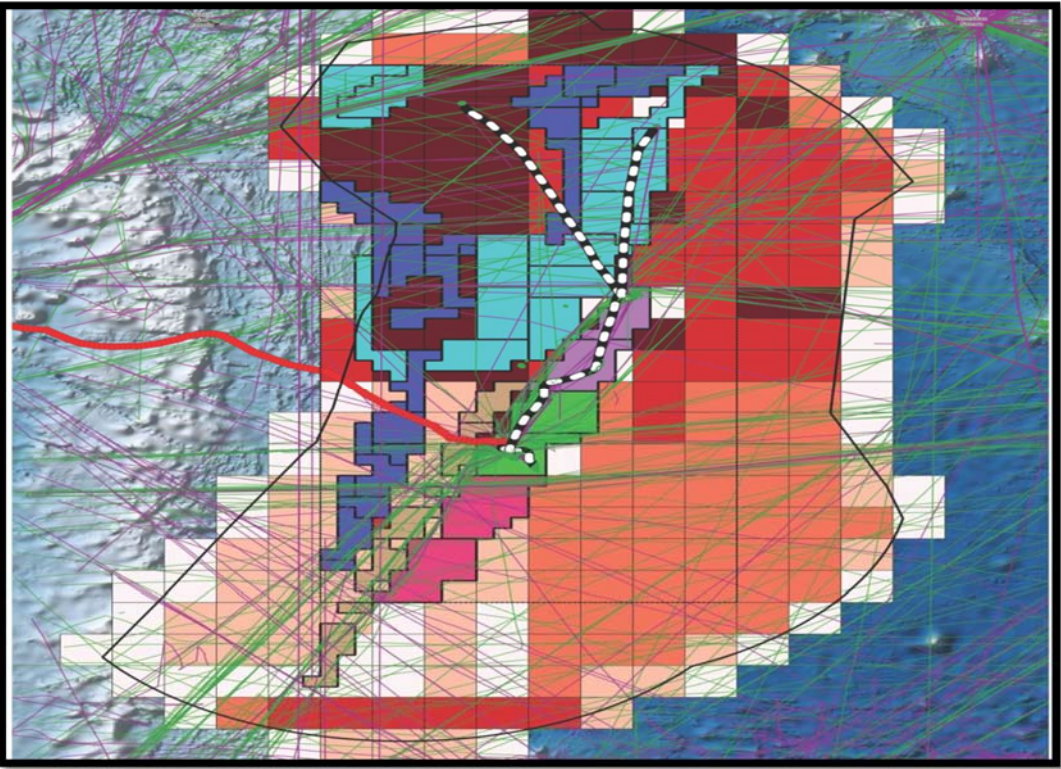
12

10.Political issues

1

Figure 5 shows the EEZ boundaries of Tonga with the current marine uses such as international/ local shipping route, underwater fibre cable, fishing ground and potential site for deep sea minerals. These existing marine uses might cause a hotspot for conflicts between the stakeholders in different activities.

Figure 5: EEZ boundaries of Tonga with different marine uses



Source: (Ministry of Lands and Survey, 2018)

—	Fibre Optic
- - -	Domestic Shipping Lane
- - -	Cargo ship shipping lane
- - -	Fishing vessel
■	Snapper/Tuna fishing site
—	Tonga EEZ Boundary
■ ■ ■ ■	Potential Deep sea-mining area

Figure 6 is a matrix table that summarizes the example from the interviewees of the incompatible activities and activities with compatible uses. The activities marked “x” represent the incompatible activities

Figure 6: Matrix of compatibility and conflicts between maritime uses in Tonga

Coastal and Offshore Uses																
Coastal and Offshore uses		Special Management Area	Whale watching	Fibre Cable	Shipping route	Fisheries	Commercial fisher	Sand extraction	Tourism	Aquaculture	Deep sea mining	MPA	Boat anchorage	Mangrove	Military uses	Ports Installation
	Special Management Area		x		x		x	x	x		x		x		x	x
	Whale watching	x			x	x					x					
	Fibre Cable							x			x		x			
	Shipping route	x	x	x					x		x	x				
	Fisheries							x	x		x		x		x	x
	Commercial fisher	x			x				x	x	x	x				
	Sand extraction	x							x			x		x		
	Tourism	x	x		x		x			x	x	x	x	x		
	Aquaculture				x			x	x		x		x			
	Deep sea mining	x	x	x	x	x	x	x	x	x		x	x		x	x
	MPA			x	x		x	x	x		x		x		x	x
	Boat anchorage	x	x	x		x			x	x	x	x			x	x
	Mangrove							x								
	Military uses	x					x	x					x			x
	Ports Installation	x						x			x					

4.5 ENVIRONMENTAL STRESSORS ARISING FROM OCEAN ACTIVITIES

Respondents outlined environmental stressors (see Table 13) arising from different sectors. There are four (4) environmental stressors identified such as unsustainable fishing practices, tourism activities such as whale watching, diving, land-based pollution and pollution from ships as well as coastal sand mining. These activities put

pressure on the marine ecosystem and deteriorate marine habitats and indeed affect the livelihood of the people

Table 13| The most common environmental stressors arising from activities in each sector and stressors arising from other sectors

Key environmental stressor arise in each sector activities	Number of interviewee who agree for the key environmental stressor impacts each sector
1. Unsustainable fishing practices	7
2. Tourism activities	3
3. Marine Pollution	5
4. Sand mining	2

5 DISCUSSION

This research will focus on the analysis of the expectations of marine spatial planning in Tonga. It addresses the main priorities for planning and what the relevant stakeholders want to achieve from marine spatial planning. It is also identified the potential conflicts that may arise in designating and managing of the MSP due to different priorities from different stakeholders.

From the evaluation of interview respondents, a number of issues and key themes have been identified for further consideration, which is essential to promote the effectiveness of the application of Marine Spatial Planning in Tonga. These opinions also highlight thoughts for strengthening ocean governance in Tonga.

5.1 EXPECTATION OF MSP IN TONGA

Individual stakeholder has its own priorities and expectations for MSP objectives. This research shows that all stakeholders agree that MSP expectations from MSP is to sustainably manage the ocean resources with improvement of economic development, food security and resilience to climate change.

Sustainability is not a universal goal of Marine Spatial Planning, though some people might like it to be. It will depend on the decision maker's priorities. The stakeholders reflecting on the ecosystem processes beneficial of the MSP. I learnt that the interviewees trying to emphasize the importance of the marine ecosystem and its sustainability which primarily support local families' livelihood and increase economic development of Tonga, therefore all stakeholders agree that MSP is important for sustainability use of the resources. The main reason draws from the fact they all agreed to this because coastal communities have been experienced and exposed to the benefits of coastal community Special Management Program in Tonga which almost have the same idea of MSP. This will make it easier for the stakeholder to compromise and find a common ground (Bouwen & Taillieu, 2004) to implement MSP. This research clearly states the need and importance to sustain the resources wisely for future use.

Another factor that the interviewees mentioned is that growing population and competition among the ocean users with multiple activities in the marine environment will affect the sustainability of the resources and endangered marine species. This highlights the impacts of human activities and ongoing interest in marine environment put threats on the ecosystem sustainability. Also reflect the idea of weakness and lack of management in place.

In this case it is reflect the current form of resources management in Tonga. At present, an individual government department regulates human activities in the ocean including conservation, which only activities align with their respective mandates. Incorporating of MSP process, they see MSP as a way forward and it is an opportunity to get the seven (7) ministries to work together on how to plan the activities and share the sea in a fair manner to prevent conflicts between the ocean users and encourage

intergovernmental and stakeholder collaboration and coordination on managing the resources and not as single sector management.

The traditional system of marine management in Tonga is strongly more focused on the top-down approach and it is important to consider a horizontal and bottom-up approach for a wider public participation and ownership of the MSP (Fraser et.al., 2006). R2 said “Marine Spatial planning should be focus on participatory approach which the NGO’s and community voice can be head instead of top-down approach”. It is recognized that in order to successfully implement agreements related to marine resources and governance of the seas, cooperation and collaboration at multi-sector level is important (Peel & Lloyd, 2004). Furthermore, stakeholder concerns and priorities are often directly useful in guiding the scope, objective, and key elements of a marine spatial plan (Douvere, 2008).

Another issue highlighting that the participation of all the marine related stakeholders, most importantly the community, have a highly influence on MSP. Thus, stakeholder engagement and participatory process for plan development is a critical component of MSP. R1 and R7 discussed that “*all stakeholders should involve and community need to ensure they understand MSP and talk the same language to reduce many other conflicts as possible*”. It should be a must to involve the community because they are skilful and familiar with their waters regarding the planning activities. The engagement of all stakeholders can encourage the process of moving forward. According to R6, “*that the effectiveness and success of MSP is result from stakeholders and community participation and working together. Tonga islands are so remote and diverse, we don’t have resources for monitoring and enforcement of MSP which they can help in monitoring and enforcement in their water*”.

One of the emergent theme that interviewees talked about which very important to aware was for stakeholders to “talk in the same language”, since there are lot of stakeholders engaged in MSP from different levels and this research shows the level of experience and background of MSP are mainly through fisheries and the special community management program in Tonga (Tupou-Taufa et al., 2016). Some

stakeholders do not have any experience in MSP, so they might understand MSP from different perspectives. Therefore, it is important for the decision makers to consult all the stakeholders to have similar understanding of MSP to avoid differences (Villa et al., 2002).

As reference based on the issue highlighted by the interviewees it truly supports what the literature says about the effectiveness of the MSP. In accordance to the governance perspective, it gives the complication of MSP, it is necessary to know all the process and requirements for effectiveness of MSP (Mayer et al., 2013). The criteria are to integrate ecosystem- based to the MSP process, participatory approach instead of focusing on top-down approach (Bryson et al., 2013). This might be difficult to find the common understanding, as some stakeholders share the interest on the marine areas and some have different and conflicting values but the main important key to consider in planning and practices is what can be done to improve the cooperation and coordination in order to utilize marine goods and services in a planned and fair manner.

5.2 PRIORITIES FOR PLANNING

Good systematic and clear priorities for planning is the foundation to support the development of marine spatial planning (Crowder & Norse, 2008). According to Table 6, it shows the ranking of priorities of each stakeholder for MSP. Individual respondents have different ranking compared to their interest and after all the nature protection is priority for MSP, followed by fisheries, marine industries and urban development. These are the ideas that various stakeholders outlined to prioritize for MSP in Tonga.

Table 7 shows that stakeholders ranked nature protection as the highest priority to consider for MSP and likely the most important and preferable priority for planning because it is directly linked to the health and safety of resources and the marine environment. According to R1, *“Nature Protection is a priority because when nature protection is conducted properly, everything else benefits”*. Also R11 claimed: *“I think*

that nature protection for me is the priority because if we do not protect it now then who is going to protect it? if we do not protect it there will be no recreational activity, there will be no fish". This specifically means that when the natural environment is protected, the other sectors will also benefit such as tourism and fisheries. The protection of nature includes marine resource such as coral, mangrove, seagrass beds, sandbanks, nesting for turtles and salt marshes e. The natural environment is affected by human activities like pollution and illegal fishing techniques.

In Table 8 fisheries became the second priority because it is a critical part of the Tongan society livelihoods as a source of food and potential economic development. Fisheries sub categories also show the highest priority to be considered as artisanal fisheries and aquaculture for sea cucumber and pearls for exports. However, stakeholders rated commercial fisheries as the lowest priority because of overfishing and undersize fishes. Further, some of the fishing techniques are unsustainable which deteriorate marine habitats.

According to Table 9 stakeholders also sees industrial and urban development as a priority for MSP because it increases the economic development of the country. They see that MSP will enforce the regulation for ballast water and control waste water from ships. In addition, a proper area for a waste water drainage system to control pollution of the ocean should be designed. Development of ports and port infrastructure for ship access is also a priority for MSP to ensure safe and secure marine environment. Deep sea mining is a priority for a potential economic development in Tonga but there was a general concern among most of the ministries and communities about the deep sea mining and its impacts toward the marine environment except the Natural Resources Department. R4 said "Deep sea mining will not affect MSP because Tonga does not have yet a mining regulation for Tonga is only for research and exploration" Therefore, a proper consultation and community awareness should be reinforced for the understanding of the people.

Recreational and tourism activities are also one of the main common activities in Tonga and one of the priorities to be considered for MSP. Recreation activities are

concerned as high priority, which include beaches, whale watching, diving and sport fishing. Beaches are very important for people of Tonga as well for tourists for picnics and swimming, so it is important to take beaches in consideration for MSP to make sure that they are clean for people to use. Whale watching and sport fishing are also important to take into consideration as well to reducing the noise from boats which affect whale niches and marine species.

Shipping routes is also a priority to make sure that there is a specific route to use by cruise ships, local boats and international cargo ships. Designation of these specific routes will help to restore and sustain a healthy marine environment and control oil pollution and rubbish from ships.

To sum up each stakeholder have different expectations and priorities. Differ in expectation and priorities make it harder to do a proper and informed plan. Since there are range of stakeholders and ocean users, the MSP coordinated team might not able to planned everything accordingly to each stakeholders' priorities and how they wanted it to be. But identifying their expectation and priorities could help to identify what is the key priorities for Tonga and what to achieve for MSP. In this case it is very important for stakeholder to come together and discuss what is the core priority that Tonga need for MSP and they work toward it instead of focus on each stakeholders need. This might help in the planning system of MSP.

5.3 USE OF ZONE APPROACH

Figure 4 represents the zoning system in Tonga. Zoning is a component of the marine spatial plan (Kenchington & Day, 2011). Zoning specifies the restricted area and no use areas and ocean space. The special management area and the marine protected area are an example of the zoning system in Tonga, which typically does not allow activities. However, the other ocean areas can highlight areas that support marine activities such as whale watching fishing and general use. Zoning may not be necessary for every activity and a zone can allow multiple activities together.

According to the interviewees, Tonga also has a commitment to implement a national action to declare 30% of the marine environment as protected area (Stone et al., 2019) based on UNCLOS and Convention of Biological Diversity (CBD), Agenda 2030, as well as Samoa Pathway (Malielegaoi, 2012). However, it has to meet the international and regional commitments. The government departments are working toward launching marine spatial planning, which has been approved by the cabinet.

The respondents highlighted that they all agree with the purposes of putting a zone for restricted use or no use for different purposes. The zone will be used for habitat protection such as corals, hydrothermal vents and mangroves. There will also be a zone for species protection such tuna fish, whale and sea cucumber. There are studies and research conducted in Tonga that identified the unique area which needs to be protected. This is essential for conservation management. These are the main marine habitats and species of Tonga which sustain the livelihood of the people and economic development. In each habitat and species, they play an important ecological and biological function in the marine ecosystem, so zoning is essential to conserve the marine environment.

As discussed the respondents prioritized nature conservation of the marine habitats and species, resource protection and ecological function among others. These priorities are consistent with the perception of nature protection and ocean health in Tonga. Tonga marine ecosystem is likely decline and with the high level of concern from overfishing impacts and land-based pollution impacts. This support by the literature say and the targets for declaring of 30% as Marine protected area. This has contributed to sustainability of the marine resources

5.4 DESIGNATION OF ZONE FOR HUMAN ACTIVITIES

A history of viewing marine systems as “common property” and “open access” has inhibited the development of spatial regulations and zoning leading to a “tragedy of the commons” in Tonga. In designation of zones for human activities fishing, whale watching, waste disposal, shipping route, mooring and anchoring and general use

should be included. All the respondents support the idea to designate a zone to control human activities in Tonga's waters. As R10 comment that "our oceans are not as rich as before, our own people responsible for it and we all have to suffer from our own consequences". R9 is arguably in need for more comprehensive marine zoning. Tonga is a very tiny and isolated islands with increasing population, significant industrial and coastal development and diversity of activities competing objectives for resources in the marine environment.

Moreover, MSP zoning system will restrict human activities in some of the area. The respondents talk more of a specific case of zoning or designate areas for particular human activities. For example, in the case of fishing, there will be a zone designated for fishing but there will be a spatial management regulation in place particularly for protected areas for dive sites, spatial restrictions on boats, and different types of fishing (e.g. restricted areas for particular species and/or fishing gear, seasonally protected spawning grounds).

Another case is to designate a zone for mooring and anchoring. In 2017, Tonga received around 62,434 tourists (Salcedo, 2018) who arrived by plane and some by yachts for different purposes such as whale watching and diving. The government received complaints from the community that they anchored and moored wherever they wanted to. These types activities impacted the ocean by destroying the reef and by dumping waste into the ocean. Whale watching is also an issue because the behavioural adaptation of the fish is disturbed. There should be a designated zone where all the yachts can anchor and moor in addition to a zone for whale watching. There should be a restriction for the whale watching operator to regulate people from coming too close to the whale. There should be a certain distance they can stand and look at the whale. Lastly is a designation area for shipping routes. Tonga does not have a designated route for ships. It is very important to designate a fixed transportation route for the ship captain to follow in case of a ship accident and pollution from the ship. Designation of zone for human activities will make it easier to monitor and enforce the regulation and avoid putting many stressors on the marine environment.

To sum up, some of the expectation and priorities shared by some stakeholders' match but some stakeholders suggest that there will be conflicts: nevertheless, some of the stakeholders proposed that a zone system should be designed for each activity, which would prevent conflicts. This highlights the idea that it might cause even more conflicts if putting a zone system for each activity. And the key question to ask is how many activities should be declaring as zone? For example: There is diversity of ocean users with different activities which very unlikely to put each zone for each activity. This might arouse many more conflicts and putting so many pressure on the marine ecosystem. At this point it is very important for all stakeholders to come together during the planning phase and identify all the main interest of Tonga from settling in MSP. After identify the main interest then they clustering the activities which might need to declare as zone system. From there each stakeholder found their interest and achieved win-win collaboration.

5.5 POTENTIAL CONFLICTS AMONG OTHER INTERESTS

This research shows all of the respondents agreed and said that there are always spatial hotspots and conflict in nature of this work. R12 say *“all sectors will try to defend their sector to the decision maker that their sector is more important than the other sectors”* Given competing objectives vying for space in the marine environment, some stakeholders are not in favour of Marine Spatial planning or ocean zoning. From the discussion is identifying that there are three (3) major conflicts occurred in the marine environment such as conflicts among inter-agencies and resource use conflicts (Tuda et al., 2014). For example;

- same resource users (between fishers using different gear)
- different resource users (between fisher and divers)
- between management agency (ministry of fisheries and tourism)

However, these conflicts and the changes in form of ocean management will slower down the MSP process in planning and implementation. Literature also state that

conflict among stakeholders in ocean management reform has proven to be a deterrent to MSP application in many locations.

This study shows that one of the main hotspot causes of conflicts is the zoning because of overlapping of two activities. Multiple uses of the same area by different sectors can cause many conflicts, mostly resulting from the need to use the same area but for different purposes or two different sectors for two different uses that serve the same objective (Prestrelo, 2016). Coastal development attracts a variety of competing uses which sometimes overlap causing adverse effects on each other (user-user conflicts) (Cicin-Sain & Knecht, 1998) or impact on the coastal marine environment (user-environmental conflicts) (Burger & Leonard, 2000; Douvere et.al, 2007). The governments are making attempts to manage conflicts between the resource user and environmental damage. There are a number of different reasons outlined that might arise among the different stakeholders. A case in point is a conflict between the tourism business operator and coastal community special management area. Some of the locations for whale watching are within the SMA boundaries that belong to the community. Therefore, they do not allow people to enter that ocean space; the community have stopped them and chased them out of their area.

Another activity also raised by the respondents is the deep sea mining area. Deep sea mining has a potential for economic development in Tonga, but it has a significant impact on the marine environment, which commercial fishers and local communities claim will be degraded and they do not support the idea of deep sea mining. Another example raised by R6 is the conflict between Ports Authority and coastal community special management area in installation of their equipment for navigation, which the community stops them from entering their waters.

These are the potential conflicts raise by the interviewees and it also come down to the needs for better communication and good planning. These conflicts can be solved by working together and united as a whole community (Fa'otusia et al., 2018). The balancing of environmental and economic activities can also take into consideration to achieved the goal of MSP.

5.5.1 Marine Uses in Tonga EEZ and Matrix of Compatibility and Conflicts Between

The map shown in Figure 5 represents the Exclusive and Economic Zone of Tonga. The black lines show the boundaries of the EEZ. This map shows different marine uses and activities within Tonga's waters. The red box represents the major fishing ground for snapper, the green line for cargo shipping route, the purple line shows the fishing boat route, and the line with black and white dots represent the local shipping routes to the islands. The different colour boxes identified the potential sea-bed mining areas in Tonga. This map shows how different activities might overlap with each other and potential conflicts which will happen within sector

These conflicts mentioned above are all come down to the issue of lack of communication and transparency among the stakeholders. Environmental impacts and multiple-use disputes are exacerbated by their often fast and uncontrolled economic growth. The need for ocean exploitation tied to economic development added to the minor concern given to environmental sustainability as well as the high socio-economic dependence on natural resources leads to environmental damage and influences ocean-dependent sectors. Due to the complexity of the ocean system and its enormous socio-economic significance and direct impact on people's livelihoods, user-user disputes (the overlap between various competing resource users' needs to be evaluated at a multi-sectoral, multi-organizational, multi-user level) (Prestrelo, 2016).

The early engagement of community and all the ocean users are very much needed to be involved in MSP. One of the issues that were raised by the respondent R5 is that they are not aware of MSP and they are not involved in the planning. That is one of the weaknesses of planning the marine spatial planning, i.e. the lack of public and community awareness. In the case of stakeholder conflict, the majority of the conflicts are happening between the ministries (management agency) and the community (resource users). For example, some of the ministries are not aware of the fisheries regulations and coastal community special management area boundaries so other people and other authorities access that area to do what they want to do without

knowing that there is a restriction and permits to enter that area (Taufa & Tupou, 2018).

In this case there are some miscommunication between the two stakeholders in terms of policy and regulation. The whole community needs to be aware of all the processes of MSP to avoid the conflicts in the long-term process.

All of the respondents agree that careful planning for marine spatial planning including better communication and transparency will solve the conflicts. The main problem is lack of participation and coordination by the ocean users in decision making. As R2 commented *“We haven’t feel our voices have been heard in terms of partnerships which need to be strengthened so our voices can be heard”* The management approaches need to change to overcome the vulnerabilities. The involvement of stakeholders can be also help to resolve the conflicts by balancing the environment and human activities. Trade-off analysis of activities can also propose as a way to solve the compatible and incompatible activities.

5.6 LIMITATION

In this research there are number of methodological challenges that I faced with during the study. The limitation of this study is the data collection. This include sending out an email to the interviewees for their approval to conduct the interview and they do not respond to the email. Also one of the challenge is conducting the interview through skype there were technical problems which I cannot count on then which caused some delayed on the write up. Another challenges are the transcription of the data. The interview was conducting in Tongan the local language then I have to translate it in English. There some lacking here in regarding the fluency of language and translation regarding some point state by the interviewee which can be missing out during the translation or I wasn’t interpret it in the right way. Time limitation for the data collection is a challenge in according to the duration of this study. The sample size of this study is too small in according to the research problem that I am investigating. This is difficult to find significant relationships from the data and with the time

restriction I couldn't able to run a statistical test in regarding to some of my questions. The sample size of the interviewees is relatively small in according to some of the stakeholders are not participated on the interview and could be biased the results but the small population that I able to interview they have a good representative and provide significant answers of what I expect to find in other places. Lastly, some aspects in the textual analysis of the results are lacking. Therefore, with this research it is hoped that it represents some factual and objective positions on some critical issues as expected and meets the requirements of the research as much as possible.

6 RECOMMENDATIONS

The foregoing discussion underline the significance of identifying the stakeholders' expectations and priorities for implementation of Marine Spatial Planning in Tonga. It also highlights the planning system and what should be expect from MSP. The identification of priorities for MSP help to settle the conflicts and overlaps of human activities in the Tonga EEZ. The assessing of stakeholder expectation will contribute for a successful implementation of MSP and improvement ocean governance in Tonga and better coordination among the MSP stakeholders.

Therefore, to achieve successful implementation of MSP it requires number of cross cutting issues for MSP decision makers to take into considerations including marine spatial planning process, communication and engagement, trade-off and evaluation for compatible and incompatible activities, data collection and support decision making. The issues are briefly discussed here under.

6.1 DESIGN PROCESSES OF MSP

As start of the MSP, MSP coordinated team should the plan the designing process of MSP in more informed ways (Santos et al., 2014). The development of the planning should be designed in ways that it will range from extremely efficient to counterproductive. MSP is a new approach to Tonga in balancing the interaction with the ocean, involving from single department operation to multi-sector which more extensive in coordinated management (Ritchie & Ellis, 2010). This change in direction needs explicit and better systematic processes. For instance, articulating who are the main relevant stakeholders to be involved in MSP to set its targets and required to involved them early in the planning phase process. Because the objectives describe the entire planning process

The issued relate to political issue which I strongly recommend that MSP should be an independent sector because if not it will get entangled by political entailments issue to only benefit one sector while other are being neglected. In the planning process the

management body should generally intends to be proactive, it is often reactive in practice because of the additional political issue. The planning process needed for proactive planning to prevent change until the effects directly impact economic and social well-being.

MSP coordinated management should coordinate and plan effectively across multiple sectors, user groups and time and space scales, which cannot generally be reactive (Fox et al., 2013). For instance, the addressing of problems at the outset rather than at the end of policy-making procedures should prevent the conflicts that arise from reactive process. This will assist in discovering positive compromises for conflicts that cannot be resolved. Conflicts can be avoiding if planning will be in coherence and execute across nested scales in both for stakeholder comprehension and adherence to MSP management plan. Coherence implies that goals, objectives, leadership instruments and actions are interlinked across the nested hierarchy without gaps.

Also, for contiguous planning areas, recognition and coordination across regional planning boundaries are crucial. For instance, the trans-boundary issues, coordinated planning is needed to support processes such as transporting pollutants or connecting marine populations across borders. In both instances, the MSP requires institutional flexibility within current organizations and an explicit declaration or reconciliation of scales. This priority suggests at least two concrete actions: (1) evaluate existing planning processes as they occur and garner lessons learned shortly after the processes finish and (2) incorporate existing planning activities and data collection into future MSP implementation efforts.

In MSP coordinated system, management should usually more efficient when there are clear and transparent lines of accountability, so that both users and executives know when they can engage and who is accountable for which aspects of the scheduling process are involved. Within Tonga, MSP coordinated team should build this sort of accountability between each other.

6.2 BETTER COMMUNICATION AND STAKEHOLDER ENGAGEMENT

Communication and stakeholder engagement are one of the most fundamental issues for better management system. Stakeholder involvement in sectors is prominent, but range of organisations that need to engage in MSP need to altered strategies. All ocean related stakeholder should be engage in (MSP) process. A better communication will significantly have benefit on MSP and the stakeholder will precisely know what is being done and why, and who will be influenced by the changes and how. Similarly, the MSP processes will be successful if all stakeholder feels fully involved in the process.

Then again one of the challenge identified is who are the stakeholders to involved on MSP. MSP stakeholders should involve all of the ocean related organization including governments ministries, non-government organizations including private companies and local communities. MSP coordinated management team should communicate with all the stakeholders on the benefits of MSP while at same time being open to difficulties, because distinct people and organization can bring dissimilar priorities and values to the table. This will allow stakeholders to be broadly communicated on what is good for MSP.

In ensuring efficient and better communication, a strategic communication plans need to be established using a straightforward and direct language adapted to each interest group. These strategic communication plan should be prepared and enabled as soon as possible to make sure the MSP coordinated team and all stakeholders are talk in the same language especially the local communities in term of level of understanding. Communication is the key to make it more understandable not complicated.

Also, it will be also helpful to have best-practice guidelines on how to effectively and meaningfully engage the full range of stakeholders, including international, regional, national, business/industry, other non-governmental, and public interests and how best to engage key individuals and groups across the broad stakeholder diversity

Finally, MSP should necessarily communicate through from both horizontal top–down approach and varying bottom–up desire and support for change. The best outcomes will be achieved by a balanced dialog between these two motivating forces, rather than a unidirectional push guidance on how to encourage and facilitate this dialog will be particularly important. Increase of public awareness strongly encourage to support effective communication of the wider public.

6.3 TRADE-OFFS AND EVALUATION FOR COMPATIBLE AND INCOMPATIBLE ACTIVITIES

Trade- off from economic perspectives define as opportunity cost in which is the most preferred possible alternatives (Burke et al., 1988). A trade-off is sacrifice that must be made to give up to get a certain product or experience (Wu & Nevatia, 2008).

To the effectiveness of MSP, knowledge and information are vital for the effectiveness of MSP including the assessment and to what extent a trade-off among uses would happened from the decisions also the identification how people value different features and services provide by the sea.

This will benefit the planning process and effort of MSP. These facts will inform the stakeholders about compatible and non-compatible in human uses of the ocean. This can provide a guidance on MSP structure and clarifying the plan constraints. The compatible/incompatible activities can determine which uses can co-exist sustainably by generally look at the context social vulnerability, human uses intensity, habitat etc. This will provide a guidance to the decision maker to assess the incompatible activities in different settings and allow transparency to improved trade off among users and their interests also provide alternatives. The quantify of trade-offs can make it clear which sector likely to benefit under different management scenarios.

The MSP coordinated team needs to integrate people has divergent values on ocean ecosystem which given different preferences on the uses and ocean benefits. Providing a guidance on how to best include these diverse values in valuation methods will help make these assessments more accurate. To find acceptable compromises is particularly

difficult when different participants are highly risk averse to different outcomes, reflecting value-based differences in weights attached to social, economic or environmental aspects of a decision (Halpern et al., 2012).

6.4 DATA COLLECTION

In implementation of Marine Spatial Plan, baseline data and mapping are an essential component in a successful plan. An explicit set of data require to identify the unique areas in Tonga. This include ecosystem service evaluation data, unique marine areas and biodiversity data. Also a socioeconomic and ecological data and environmental impact assessment (EIA) should also conducted to aid for decision making and make it more objectives.

Another issues identified regarding the data availability to the public. Each ministry has their own policy regarding sharing and availability of the data to the public. Some of the data require permission to access. To minimized the data gaps, data policy should be review in term of availability. The availability of data to the public and researcher attracting more scientists or researcher to do research and get more data for Tonga also will make it easier to identify which areas has data and doesn't.

The introducing of citizen science is also a greater benefit to the government to involve the local communities into data collection and taking photographs not only help to decision making but increase the amount of data (Jarvis et al.,2015). For instance, MSP coordinated team should take in consider of encouraging citizen science volunteers to involve in the process and train them. This will help in input and updating more data and help in monitoring of the MSP.

6.5 SUPPORT DECISION MAKING

Decision-making practices for MSPs should be well constructed. Decision-making should take into consideration all components of the decision-making concern. As an outcome, a group assigned to address an issue very often continued to concentrate on

a certain solution that were approved by the majority of stakeholders. In order to reduce bias in decision-making and ensure the application of the most appropriate measures, MSP should integrate the spatial features of marine and social systems, which can be used to analyse and integrate components of ecology (natural resources) and socioeconomics (human uses) in order to identify effective approaches for sustainable development and to allocate consumers of marine resources through a policy mechanism that improves long-term impacts of the planning and decision-making.

The decision-maker should be supported and advised of the potential implications of decisions on the use of space and resources. Implementation of the objectives of the sector may potentially lead to a pattern of conflict. This illustrates the need for joint planning between all appropriate industries to alleviate future conflicts. Prior evaluation should be enforced and more data collected on MSP socio-cultural risk identification and ecological risk identification. Risk assessment management process on every activity should be conducted for informed decision making.

7 CONCLUSION

In conclusion, this paper has an overview of MSP from assessing the stakeholder expectations of MSP. It has also identified the stakeholder priorities towards MSP. Marine Spatial Planning can be used as a tool to conserve and sustain marine resource of Tonga. Marine Spatial planning can also help to plan out the human activities in the ocean to avoid overlaps and conflicts among the ocean users by identifying what is the priorities that Tonga expect from settling in MSP. In doing so, it has also explored the potential and multiple activities which might cause conflicts in the implementation of MSP. These activities majority relate to economic activities such as tourism activities, commercial fishing, shipping routes and the fear of deep sea mining. As observed that these activities put pressure on the marine environment by deteriorate the marine habitat and its biodiversity. The study also discusses some important elements which contribute to the success in planning and designing of MSP in Tonga. This include by early inclusion of all stakeholder in planning of MSP, including international, regional and national level. Public awareness is one of the crucial part for MSP for people to understand of the process and avoid future complication. Identifying the government expectations and priorities on MSP to make it easier for the planning to matching the compatible and incompatible activities. This will help to find a common ground of understanding and avoid multiple conflicts. A proper zoning system proposed can be solve the overlaps of human activities. In doing so, explicit set of data also important including the areas which haven't conduct a survey before, socio-economic and impact assessment data etc. this data will support decision making. The analysis also highlighted MSP as a way forward for better communication to manage the ocean resource instead of focus on a single sector management. Integration of all ocean users in MSP as a beneficial for a proper planning and ensure coordination and collaboration in every level. MSP is still in public consultation process in Tonga. It is hope that this undertaken research will contribute to its progress and support the MSP coordinated team in Tonga in planning to achieved successful application and the implementation of MSP in Tonga.

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9 APPENDICES

APPENDIX A: INTERVIEW QUESTIONS

Semi-structure Interview Questions

Name:

Organisations:

Gender:

Age:

Topic: Assessing Stakeholder Expectations for Marine Spatial Planning in Tonga: Implication for Governance

(In every question there will be a sub categories question will ask in between)

1. Background Information (An overview on let the interviewee introduce himself/herself)
2. Can you tell me what you know about MSP and how is your ministry involved in MSP?
3. What does your ministry want to achieve from MSP?
4. If some areas are to be zoned for restricted use or no use, what should be the purpose?
5. Would you like to see specific zoning or designations of areas for particular human activities?
6. What do you think should be prioritized in MSP?

Please rank priorities from your point of view from highest priority to least priority (perspective of the respective organization?)

Nature protection

Shipping

Recreation

Fisheries

Marine industries and urban development

7. Why did you choose your first two priorities?
8. In the three priorities you ranked as highest priorities, please rank the subcategories from highest to lowest priority: *(List will send beforehand and then ask during the interview)*

Nature protection

Coral reefs
Seagrass beds
Sandbanks
Mangrove
Nesting for turtles
Salt marsh

Shipping routes

Cruise ship routes
Local navigation
Port access and national shipping routes

Recreation

Diving
Whale watching
Sport fishing
Beaches

Fisheries

Commercial Fisheries (trawl)
Artisanal fisheries
Aquaculture (for sea cucumber exports)
Aquaculture (Oyster farms for pearls)

Industrial and urban development

Deep sea mineral sites for extraction

Waste water drainage

Ports and port infrastructure including port access

9. How do activities in your ministry interact with the list above?
10. How do activities in your ministry interact with the list above?
11. Are there spatial hotspots for conflict among different interests?
12. What kind of environmental stressors arise from activities in your sector?
13. What kind of environmental stressors arise from activities in other sectors?

APPENDIX B: CONSENT FORM



CONSENT FORM

(Government/NGO's Participant)

Project title: Expectations for Marine Spatial Plan in Tonga: Implications for Governance

Researcher: Hulita Lamasialeva Fa'anunu

Supervisor: Prof. Mary Wisz

I have read the Participant Information Sheet and understand the purpose of this research and why I have been chosen to participate. I have had the opportunity to ask questions and have them answered to my satisfaction.

- I understand my employer has given permission for me to partake in this research.
- I agree to participate in this research.
- I understand that I will not be paid for my participation
- I understand the interview may take up to one hour.
- I understand that I am free to withdraw at any time during the interview and to withdraw any information provided interview without giving a reason.
- I understand that the interview will be recorded or by writing down answers to questions and sent to me.
- I DO/DO NOT give permission to be audio-recorded and understand I may request that this is turned off at any stage during the interview.
- I DO/DO NOT wish to receive a copy of the transcript/ digital recording.
- I understand that if I do receive a copy of the transcript I will have the opportunity to edit the transcripts of the interview recordings and return them to the researcher within 10 days of receiving them.
- I DO/DO NOT wish to be identified by name in this research.
- I understand that if I do not wish to be identified by name in this research, a generic position description will be used. I also grant permission to use one of the following (*please select one*):
 - ☐ My full name
 - ☐ My first name only
 - ☐ A pseudonym
- I understand that if a generic position descriptor will be used in the research, in an endeavor to protect my identity, that due to the small number of people working in this field my anonymity cannot be guaranteed and that I may be recognisable.
- I understand data collected in this interview process will be used by the researcher to complete her master's thesis and may also be used in other publications/ presentations.
- I understand all data will be stored safely until the completion of the study
- I understand that if I wish I will be given a signed copy of this document to keep and sent to my email.
- I wish to receive a summary of the thesis, which can be emailed to me at this email address: _____
- I understand that this research study has been reviewed and approved by the Research Ethics Committee (REC) of the World Maritime University and that I may contact the research supervisor with any queries I may have.

- I have read and understand the explanation provided to me. I have had all questions answered to my satisfaction, and I voluntarily agree to participate in this study.
- I have been given a copy of this consent form.

Signature of Participant

Date

I believe the participant is giving informed consent to participate in the study.

Researcher

Date

APPENDIX C: PARTICIPATION INFORMATION SHEET



PARTICIPATION INFORMATION SHEET

(Employee)

Project title: Assessing Stakeholder Expectations for Marine Spatial Plan in Tonga: Implications for Governance

Researcher: Hulita Lamasialeva Fa'anunu

Supervisor: Professor Mary Wisz

My name is Hulita Lamasialeva Fa'anunu. I am currently studying for a Master of Science in Maritime Affairs specialized in Ocean Sustainability, Governance and Management at World Maritime University. The purpose of my research thesis is to identify the priorities of each ministry for Marine Spatial Plan and implication for ocean governance.

I would like to invite you to participate in an interview as a part of this study. I have the assurance of your CEO/Manager that your decision to participate or not participate will not affect your employment status or your relationship with them. Participation in this study is voluntary.

The Research Project:

This project aims to identify the main priorities for MSP for the different ministries, and what they hope will be the result from MSP also identify potential conflicts that may arise while designating and/or managing of the MSP due to different priorities from different ministries and future recommendation to support the effectiveness in implementation of MSP in Tonga. Your insights into these matters will be beneficial due to your knowledge and experiences working in this area.

Interview Request:

I would like to interview you about your experiences in developing of Marine Spatial Planning in Tonga. In particular, I would like to speak with you about, the main priorities of your ministry and what do you expect from marine spatial planning, what should be prioritize for MSP and possible conflict due to different priorities from the different ministries.

The interview will follow a semi-structured format, which means I will ask some prompting questions during the interview that allow us to explore relevant topics in a conversation through skype and video conference. This format allows you to bring up new ideas during the interviews. It will take an estimated time of up to one hour. The timing for the interview will be based on what is convenient for you. During the interview process I will take notes. If you agree I will also audio-record the interview. If you agree to be audio-recorded, you may ask for the recorder to be stopped at any time without having to give a reason. Audio-recorded interviews will be transcribed by the researcher;

If you wish you may receive a copy of the transcript and/ or digital recording. If you do receive a copy of the transcript you will have the opportunity to edit the transcript of the interview recording and return to the researcher within 10 days of receiving them. This will be arranged over email.

Use of Collected data:

The data collected during this research project will be used to complete master's thesis research and for the production of the thesis. Data may also be used in publications or presentations arising from this thesis.

A summary of the thesis will be made available to you if you choose to receive a copy and this will be sent through email.

Privacy:

The information collected about participants will be kept private with strict confidence. You are given the option to be named in research. If you do not wish to be named in the research, then your identity will be excluded from academic publications and presentations arising from this research. I will ensure that every possible effort will be made to ensure your identity remains anonymous. A generic position descriptor (job position/ organization name) will be used with the given permission from your manager. However, due to the small number of participants and specialised nature of your role it still may be possible your identity will be identifiable by the nature of your comments.

Data Storage and Consent:

All data related to the study will be stored securely and kept until the completion of this study. The audio recordings taken during interviews will be kept on a computer protected by a password. Data will also be stored on a secure University computer with a server backup. Hard copies of data (i.e. transcripts, notes) will be securely stored in a locked filing cabinet. Consent forms will be stored in a locked cabinet in the supervisor's office on the University premises. All material will be retained for the research period, and then will be either deleted or shredded.

The information you provide will only be used for the purpose of this research project and it will only be disclosed with your permission.

Please read this information carefully. Ask questions about anything that you don't understand or want to know more about before deciding whether or not to take part.

Participation in this research is voluntary. If you don't wish to take part, you don't have to.

If you decide you want to take part in the research project, you will be asked to *sign the consent form*. By signing it you are telling us that you:

- Understand what you have read
- Consent to take part in the research project

Wish to withdraw:

You will be allowed to withdraw from the interview at any time, without giving a reason.

Thank you very much for your time. If you have any queries or wish to know more, please feel free to contact me or my supervisor at:

Researcher contact information:

Hulita Lamasialeva Fa'anunu
Ocean Sustainability Governance and Management
World Maritime University
Malmö, Sweden
Email: w1802588@wmu.se

Supervisor contact information:

Dr. Mary S. Wisz
Associate Professor, Marine Science
World Maritime University (WMU) of the
International Maritime Organization (IMO), a Specialized Agency of the United Nations.
Email: msw@wmu.se

APPENDIX D: TONGA GOVERNMENT RESEARCH PERMIT



PRIME MINISTER'S OFFICE
NUKU'ALOFA, TONGA

Ref:ORG 1/8 v.19

5th August, 2019

Ms. HulitaLamasialeva Fa'anunu
World Maritime University
Malmo
SWEDEN

Dear Mr. Hulita L Fa'anunu

RE: Tonga Government Research Permit

I am pleased to inform, that the Prime Minister's Office has approved your application to conduct research in the Kingdom of Tonga for your Master of Science degree in Maritime Affairs titled "Expectation for Marine Spatial Plan in Tonga: Implications for Governance."

Your proposal has compiled with all the relevant requirements under the Government Research Policy as stipulated under His Majesty's Cabinet Decision No.410 of 12 May 2011. Kindly note that the Ministry of Education & Training has granted their support.

This permits allows for your fieldwork to be conducted for the period of July, 2019 as proposed but this permit will allow you to conduct your research by Kaione Loumoli effective from the date of this letter for a month and upon request may be extended at our discretion.

We look forward to the completion of your report and appreciate your future submission as a valuable resource to the Government of Tonga especially Ministries, Public enterprises and NGOs whose mandates are related to the Maritime industry.

We wish you all the best with your research and success in your future endeavours during your time in the Kingdom. Should you require further assistance, please do not hesitate to contact our office.

Sincerely,

Mr. Edgar Cocker

Chief Secretary & Secretary of Cabinet



Cc: *As/CD Education & Training*
Deputy Secretary, Planning Division (PSD)
CEO, Ministry of Fisheries
CEO, Ministry of Tourism
CEO, MIBD&CC

CEO, Ministry of Internal Affairs
CEO, Ministry of Lands and Natural Resources
CEO, Ministry of Public Enterprises

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